



Blackboard Review on Wireless Routing Accuracy

California 9-1-1 Emergency Communications Branch

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Basic Concepts

- We are limited by technology (Sector/ESN)
- There will be call transfers between PSAPs
- A call routed as designed is routed properly
- The system is not broken
- Is there a correct PSAP?



2014 California 9-1-1 Statistics

- Total wireless calls/year: 21.2 M
- Total transfers: 3.2 M (15.1%)
- Total transfers Primary-Secondary: 1.3 M (6.2%)
- Total transfers Primary-Primary: 1.9 M (8.9%)
- Currently: Appox. 278,000 cell sectors



PSAP Transfers (Sample)

Transfers vs Total Wireless Call Volume							
PSAP	Total Wireless	Total Transfers	% Total Transfers	Transfers to Secondary Fire/EMS	% Transfers	Transfers to other PD, SO, CHP	% Transfers
PSAP A	4448	1040	23%	414	9.30%	626	14.10%
PSAP B	89037	15434	17.30%	9196	10.30%	6238	7.00%
PSAP C	75287	11175	14.80%	7276	9.70%	3899	5.18%
PSAP D	23937	5358	22.40%	2449	10.20%	2909	12.20%

Call data taken from January through April 2015



What Can Be Done Today?

- Utilized existing ECaTS contracted services
- Routing analysis reports developed to respond to routing concerns
- Allows CC/PSAP to evaluate routing by:
 - Multiple reports
 - PSAP/CC can review – any time
 - Over any time period
 - Any cell sector
 - Any PSAP
- ECaTS connectivity to all 451 PSAPs

Call Transfer Count Report

Transfer Psap Name	Transfer to Elk Grove PD from	Transfer from Elk Grove PD to
CHP Rancho Cordova (Sacramento)	130	134
Citrus Heights PD	0	1
Sacramento PD	0	49
Sacramento Regional Fire	11	576
Sacramento Sheriff	4	62
Total	145	822

- User can select one PSAP and sees all transfer counts to and from each PSAP included in that instance.
- Allows user to quickly identify overall transfer counts to and from their PSAP, across the State, County, etc.

Wireless Transfer Summary Report

Wireless Transfer Summary

Butte County Sheriff

Report Date: 04/15/2015 04:45:06
 Report Date From: 03/01/2015
 Report Date To: 03/31/2015
 Call Type: 911 Calls
 Abandoned Filters: Include Abandoned
 Agency Affiliation: All
 Carrier:
 Transfer 50
 Sector Volume: 5
 Tower Address:

Originating PSAP	Tower Address	Sector	Carrier	WPH1	WPH1 Trans.	WPH2	WPH2 Trans.	Total 9-1-1 Calls	Transfer Details		Plot Calls
									Transfer PSAP	% Transferred	
Butte County Sheriff	215 ORANGE	SW	TMOB	2	0	15	14	17	Chico PD	82.35%	Visualize
Butte County Sheriff	9160 AGUAS FRIAS RD	NE	VZW	0	0	7	4	7	CHP Chico	57.14%	Visualize
Butte County Sheriff	BLOOMER HILL	S	VZW	2	1	4	2	6	CAL FIRE Oroville	50.00%	Visualize

- Provides detailed transfer information based on starcode
- Starcodes used and displayed on the report can also be mapped to PSAP names (information needs to be provided to the State/ECaTS)
- Report provides and groups information by:
 - Tower address and overall number of calls received on tower address
 - Sector and sector directionality
 - Carrier name
 - Transfer to and from PSAPs
 - Number of WPH1 and WPH2 calls received and transferred to a specific PSAP

Routing Analysis Report

Routing Analysis Report

- Determines if a caller's location matches the reported sector information as indicated by the ALI Latitude/Longitude and sector direction information.
- Compares the ALI sector direction to the routing table azimuth.
- Each value will generate a score, and higher scores are associated with colors as shown here.

Routing Analysis		Report Date:	04/15/2015 05:19:48
CHP Los Angeles		Report Date From:	03/01/2015
		Report Date To:	03/31/2015
		Agency Affiliation:	All
		Min Call volume:	50
		Direction Score:	All
		Azimuth Score:	All
		Combined Score:	All
		Carrier:	All

					SECTOR ALI DIRECTION						SECTOR ROUTING AZIMUTH						SECTOR DATA COMBINED						
PSAP Name	Tower Address	Tower Location	Carrier	Total # of Calls	Direction	Inside		Outside		Score	Azimuth (Confidence)	Inside		Outside		Score	Match	Inside		Outside		Score	Plot Calls
						#	%	#	%			#	%	#	%			#	%				
CHP Los Angeles	10121 MAIN	LA TB 0704 C5	Sprint	85	NE	80	94%	5	6%	1	50	81	95%	4	5%	1	Y	80	94%	4	5%	1	Visualize
CHP Los Angeles	15342 HAWTHORNE	LNDL TB 0733 D5	Sprint	50	N	0	0%	50	100%	5	N/A	0	0%	50	100%	5	N	0	0%	50	100%	5	Visualize
CHP Los Angeles	1925 VERNON	LA TB 0674 G3	Sprint	70	SW	70	100%	0	0%	1	215	70	100%	0	0%	1	Y	70	100%	0	0%	1	Visualize
CHP Los Angeles	2614 WHITTIER	LA TB 0635 A6	Verizon	81	N	77	95%	4	5%	1	350	76	94%	5	6%	1	Y	74	91%	2	2%	1	Visualize
CHP Los Angeles	2626 LACY	LA TB 0594 J6	Verizon	59	NW	44	75%	15	25%	3	310	44	75%	15	25%	3	Y	44	75%	15	25%	3	Visualize
CHP Los Angeles	369 MANCHESTER	LA TB 0704 C2	Sprint	66	SE	56	85%	10	15%	2	N/A	0	0%	66	100%	5	N	0	0%	10	15%	2	Visualize
CHP Los Angeles	420 SLAUSON	LA TB 0674 B5	Sprint	71	E	57	80%	14	20%	2	100	62	87%	9	13%	2	Y	57	80%	9	13%	2	Visualize
CHP Los Angeles	420 SLAUSON	LA TB 0674 B5	Sprint	60	SW	40	67%	20	33%	3	240	49	82%	11	18%	2	Y	40	67%	11	18%	2	Visualize
CHP Los Angeles	4550 MARATHON	LA TB 0593 J6	Verizon	51	N	43	84%	8	16%	2	0	43	84%	8	16%	2	Y	43	84%	8	16%	2	Visualize
CHP Los Angeles	4550 MARATHON	LA TB 0593 J6	Verizon	66	E	29	44%	37	56%	5	110	46	70%	20	30%	3	Y	29	44%	20	30%	3	Visualize
CHP Los Angeles	4550 MARATHON	LA TB 0593 J6	Verizon	64	SW	54	84%	10	16%	2	230	46	72%	18	28%	3	Y	46	72%	10	16%	2	Visualize
CHP Los Angeles	5542 WASHINGTON	LA TB 0633 B6	Verizon	53	E	50	94%	3	6%	1	110	52	98%	1	2%	1	Y	50	94%	1	2%	1	Visualize
CHP Los Angeles	715 CENTRAL	GLDL TB 0564 E3	Verizon	118	E	110	93%	8	7%	1	110	113	96%	5	4%	1	Y	110	93%	5	4%	1	Visualize
CHP Los Angeles	8106 FIGUEROA	LA TB 0704 B2	Verizon	114	SW	112	98%	2	2%	1	230	111	97%	3	3%	1	Y	111	97%	2	2%	1	Visualize

Mismatched ESN Report

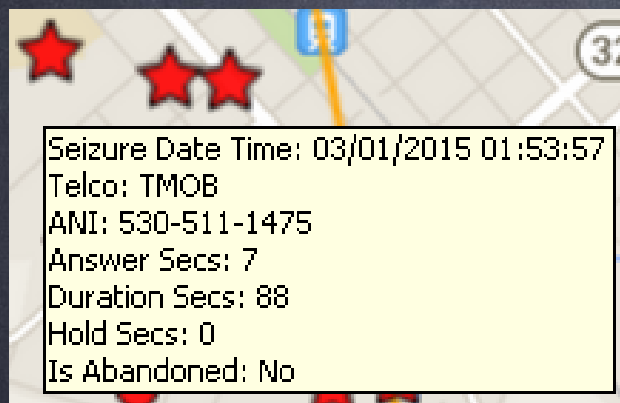
- Routing Sheet ESN do not match for a particular sector.
- Using transfer logic based on time, the report include only calls where it was the first call in a transfer leg at the selected PSAP.
- The report uses time logic to exclude calls where the ALI ESN and Routing Sheet ESN do not match due to a transfer.

Mismatched ESN		Report Date:	04/15/2015 05:34:30
CHP Los Angeles		Report Date From:	01/01/2015
LAPD Metro		Report Date To:	04/15/2015
		Call Type:	911 Calls
		Abandoned Filters:	Include Abandoned
		Agency Affiliation:	All
		PSAP Size:	All

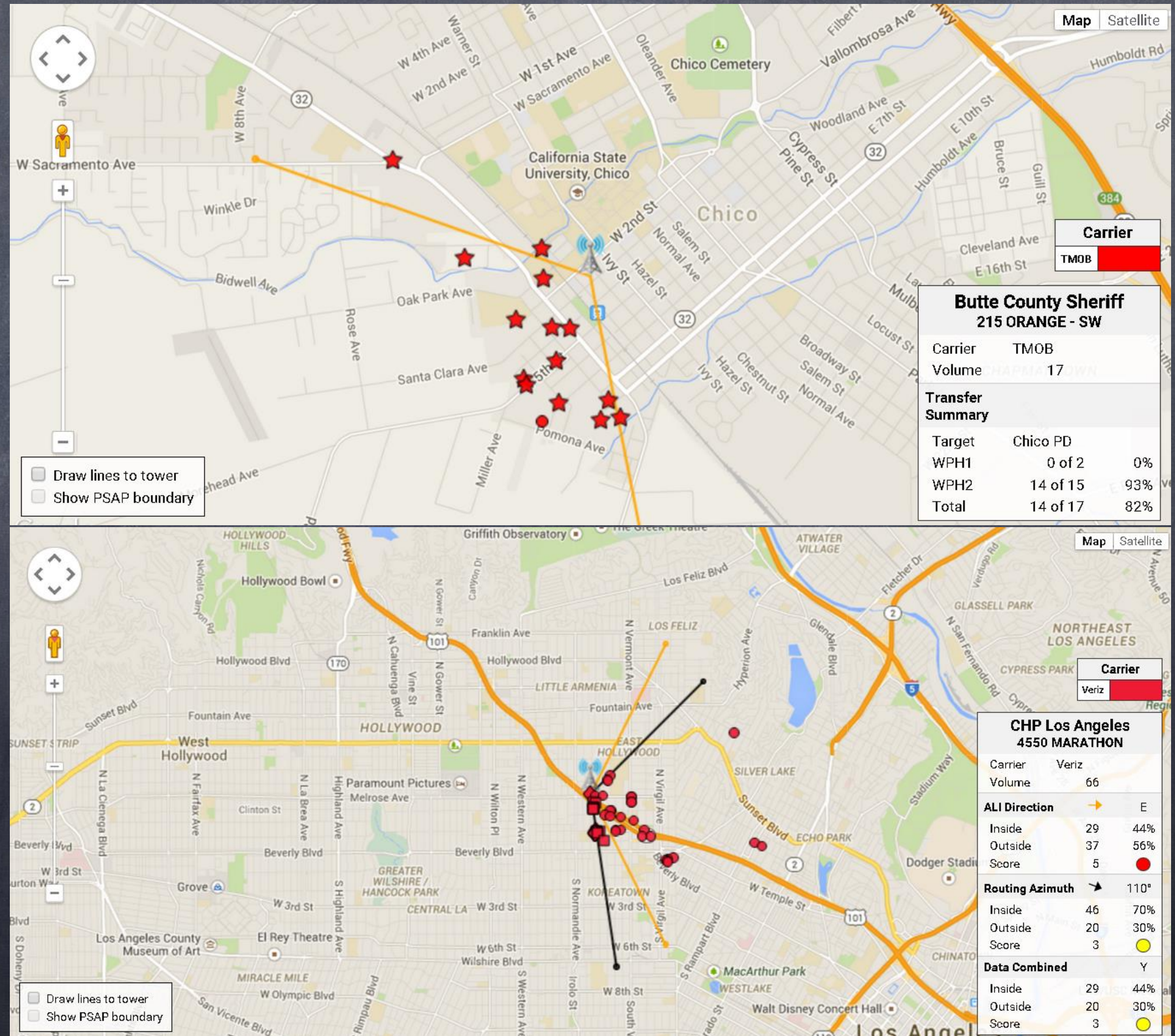
ALI PSAP Name	Tower Address	Tower Location	Sector	Carrier	Routing ESN	Routing PSAP Name	ALI ESN	# Calls
CHP Los Angeles	10239 VASSAR AV	CHAT TB 0500 A4	E	ATTMO	659	CHP Los Angeles	660	101
CHP Los Angeles	1028 W LARK	COV TB 0598 G5	N	VZW	620	LASD San Dimas Sheriff	662	3
CHP Los Angeles	10950 1/2 S CENTRAL AV	LA TB 0704 F6	E	VZW	660	CHP Los Angeles	601	6
CHP Los Angeles	10950 1/2 S CENTRAL AV	LA TB 0704 F6	SW	VZW	658	CHP Los Angeles	601	2
CHP Los Angeles	10950 S CENTRAL AV	LA TB 0704 F6	E	VZW	660	CHP Los Angeles	601	9
CHP Los Angeles	10950 S CENTRAL AV	LA TB 0704 F6	N	VZW	638	LAPD Metro	601	1

Plotting of Phase 2 Calls by Cell Sector

Wireless Transfer Summary Visualization



Routing Analysis Report Visualization



Identifying New Cell Sectors

New Tower History Report

This report is to provide an ongoing output of new towers based on historical data.

The report will compare historical data to data received in the last 24 hours to isolate new sectors/towers that sent data for the first time into the system.

This report can also be scheduled to be delivered to the user's email in the desired frequency (daily, weekly, monthly, quarterly and annually).

New Tower History Report

PSAP 1

Month - Year:May 2015

Report Date:05/11/2015 16:02:56

Report Date From:05/10/2015

Report Date To:05/10/2015

Period Group:Month

Carrier	PSAP County	PSAP	Tower Address	Tower Location	Sector	Detected Date
ATTMO	Alameda	Alameda County Regional Fire/LLNL	BANCROFT AV, WURSTER HALL, UC BERKELEY CAMPUS	BERK TB 0629 J2 SE	SE	01/27/2015
ATTMO	Alameda	Alameda County Regional Fire/LLNL	BANCROFT AV, WURSTER HALL, UC BERKELEY CAMPUS	BERK TB 0629 J1 SE	SE	01/27/2015
ATTMO	Alameda	Alameda County Regional Fire/LLNL	BANCROFT AV, WURSTER HALL, UC BERKELEY CAMPUS	BERK TB 0629 J1 SW	SW	01/16/2015
ATTMO	Alameda	Alameda County Regional Fire/LLNL	BANCROFT AV, WURSTER HALL, UC BERKELEY CAMPUS	BERK TB 0629 J2 SW	SW	01/29/2015

Reports in Day, Week, Month, and Year Formats

All reports can be generated for any desired date range. In addition, reports feature Period Grouping to determine how data is displayed.

Period Group:

Month	▼
Day	
Week	
Month	
Quarter	
Year	

Reports can also be scheduled in a daily, weekly, monthly, quarterly or annual format.

Wireless Transfer Summary Options

Select Date Range: ▼ Output Format: ▼

Carrier: ▼ Transfer percentage: % Sector volume:

PSAP transferred to: ▼

 [Update](#)  [Cancel](#)



Current ECaTS Call Data Reporting

Contract Costs

- Overall three(3) fiscal years total: \$3,427,774
 - FY 11/12: \$1,189,524
 - FY 12/13: \$1,172,903
 - FY 13/14: \$1,065,347
- Cost Includes all ECaTS reporting
- Connectivity to all 451 PSAPS



Call Data Report Development

- Allow for development of additional reports if required
- PSAP shape files to be added
- Deployment schedule - All CC currently have access
- Training Schedule - In development

Successes

- CHP has utilized to:
 - Review 389 Sectors
 - Requested 169 to cut
- Press release by Assembly Member Williams



History of Routing on Empirical Data

- RED: Project scope - Designed reduce busies of 911 calls
- Reviewed: 140,000 cell sectors
- Identified for review: 22,442 (16%)
- Rerouted: 9,662 (6.9%)
- Sequential review of cell sectors
- Contractor did all analysis
- PSAP/CC utilized information to make decision
- Cost: 7.9 Million, 2007 - 2011



Procuring Technology Similar to Routing on Empirical Data project

- Procurement Source: CalNET 2
 - Who: State, or any tax funded entity (City, County)
- Requirements:
 - Form 20
 - Develop SOW/Specs
 - Approvals
 - Agency spending authority
 - Identify funding source
- Will require additional connectivity
- Addition of PSAP shape files

CALNET 2 - Potential Sector Review Pricing

Feature	Identifier	NRC	MRC	Unit
Wireless Sector Review/ESN Routing (RSDS) 1 - 4,000 sectors / month	911WSR1	\$ 0.00	\$ 41.00	Per Sector
Wireless Sector Review/ESN Routing (RSDS) 1 - 5,000 sectors / month	911WSR2	\$ 0.00	\$ 39.98	Per Sector
Wireless Sector Review/ESN Routing (RSDS) 1 - 6,000 sectors / month	911WSR3	\$ 0.00	\$ 37.93	Per Sector
Wireless Sector Review/ESN Routing (RSDS) 1 - 7,000 sectors / month	911WSR4	\$ 0.00	\$ 36.90	Per Sector
Wireless Sector Review/ESN Routing (RSDS) 1 - 8,000 sectors / month	911WSR5	\$ 0.00	\$ 35.88	Per Sector

<u>Pricing:</u>	<u>Cost/Mo</u>	<u>Cost/Yr.</u>	<u>Yrs-Finish</u>	<u>Total Cost</u>
4000 Sec/Mo	164,000	1.968 Million	5.8	11.4 Million
6000 Sec/Mo	227,580	2.731 Million	3.9	10.7 Million
8000 Sec/Mo	287,040	3.444 Million	2.9	10 Million

* Based on review of 278,000 sectors

Thank You

Questions?